Enhancing Digital Pedagogy Skills of Higher Education Teachers in the context of Indian National Education Policy 2020

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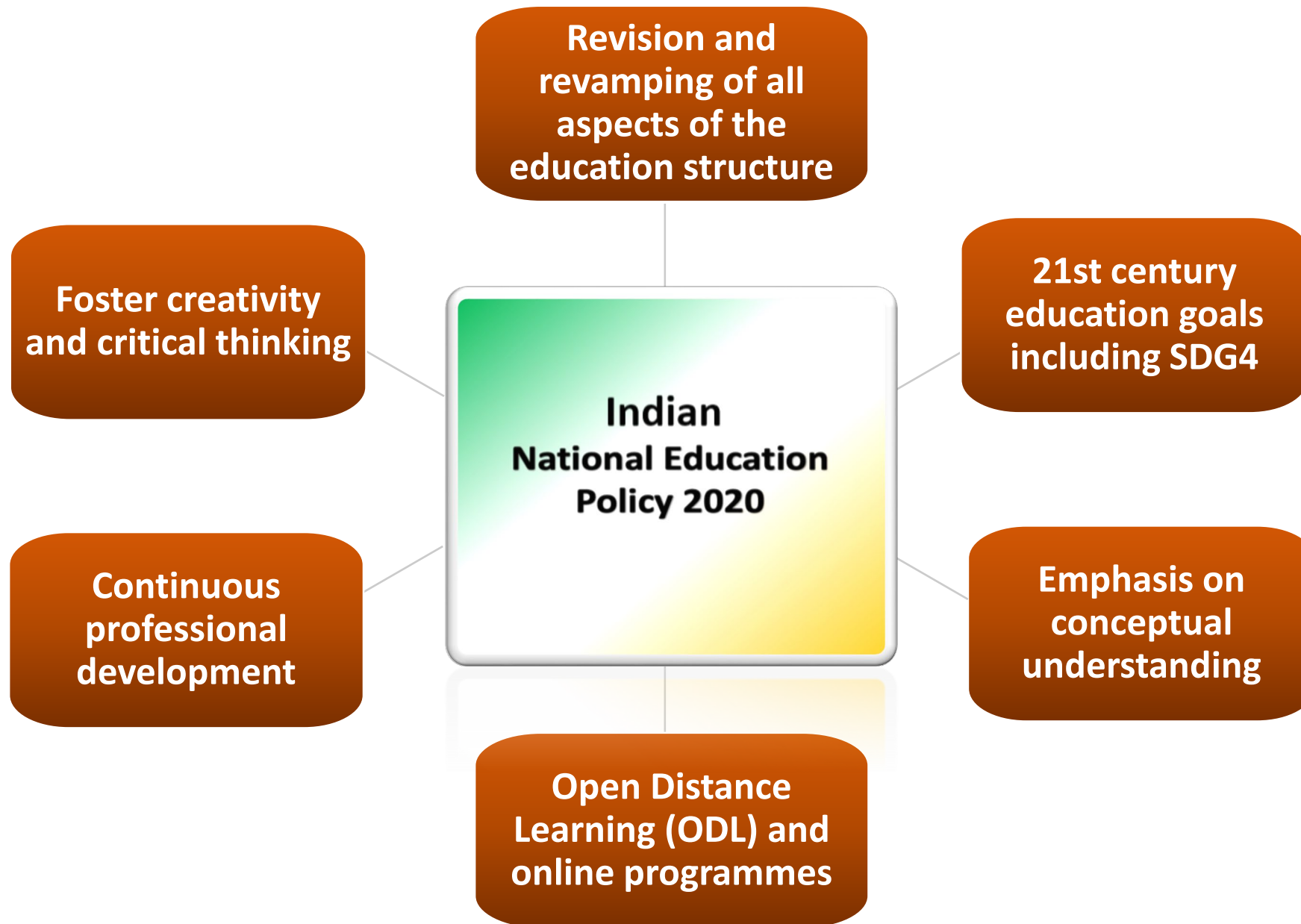
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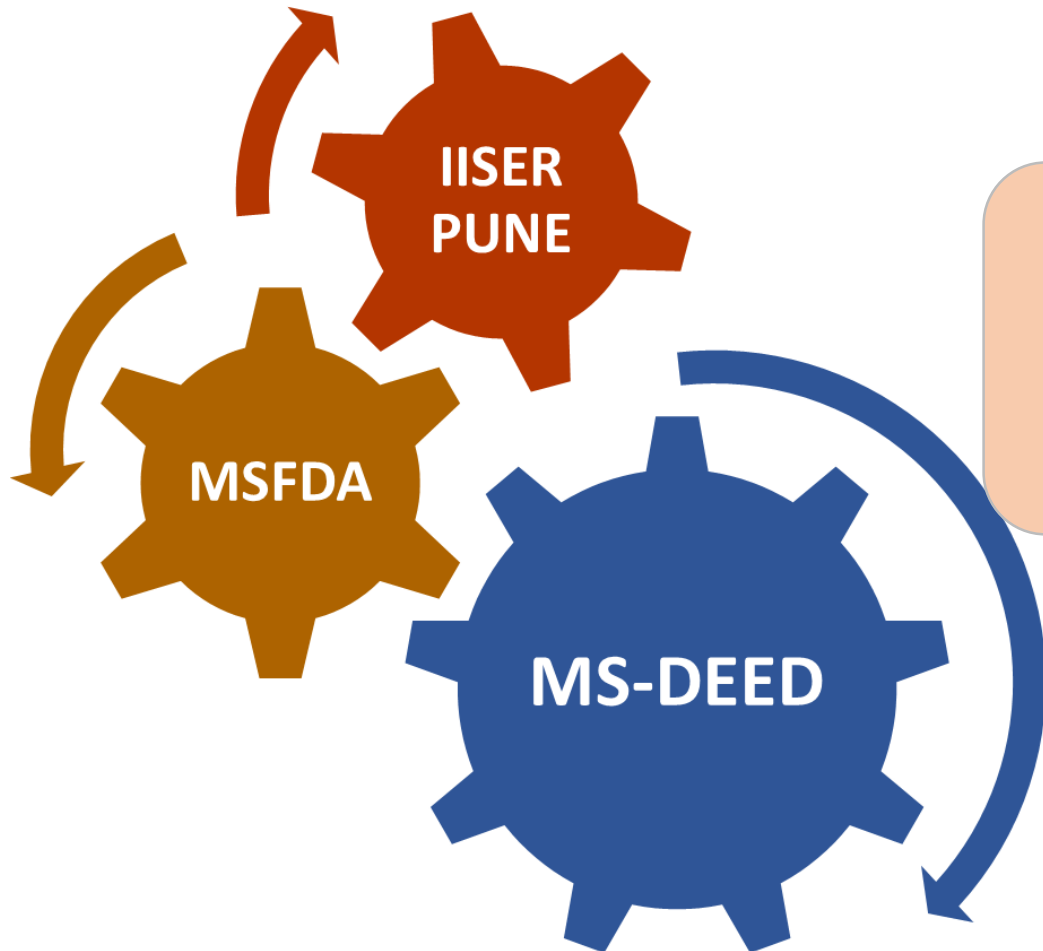*[2]Indian Institute of Science Education and Research (IISER) Pune - 411008, India*

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**BRIDGES_symposium_1 (Online learning symposium)
"Bridging Educational Emergency to Digital Pedagogies"**
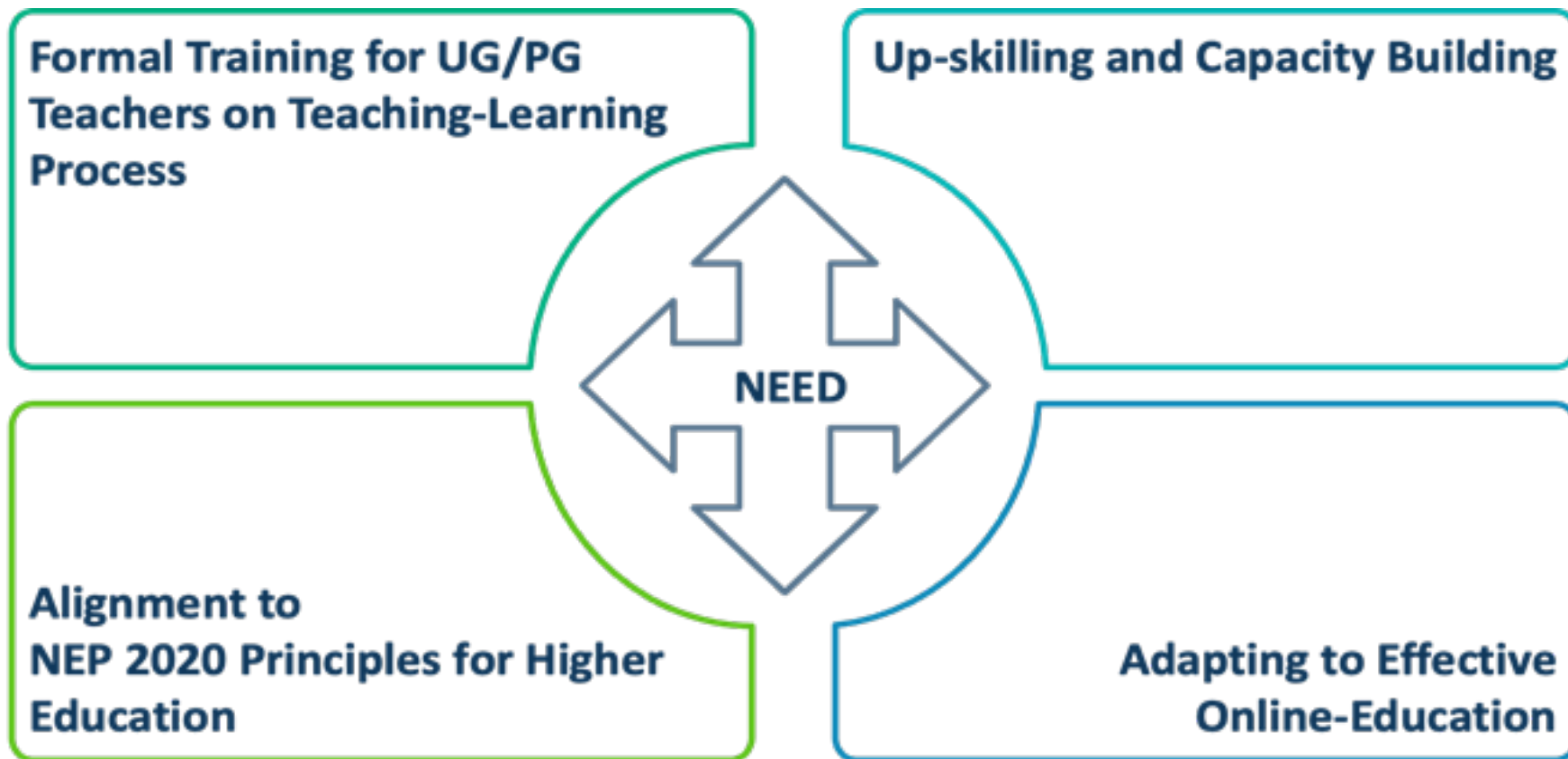
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Indian National Education Policy 2020

- Revision and revamping of all aspects of the education structure
- 21st century education goals including SDG4
- Emphasis on conceptual understanding
- Open Distance Learning (ODL) and online programmes
- Continuous professional development
- Foster creativity and critical thinking

Ideation of MS-DEED Program

IISER PUNE

MSFDA

MS-DEED

The Indian Institute of Science Education and Research **(IISER)** Pune has collaborated with the Maharashtra State Faculty Development Academy **(MSFDA)** from the year 2021, to develop and run a comprehensive professional development program for the in-service undergraduate/postgraduate teachers

The program aims to create a dynamic ecosystem of high-quality education through training and up-skilling of UG/PG teachers from HEIs in Maharashtra over the period of 3 to 5 years and has trained over 1000 teachers so far
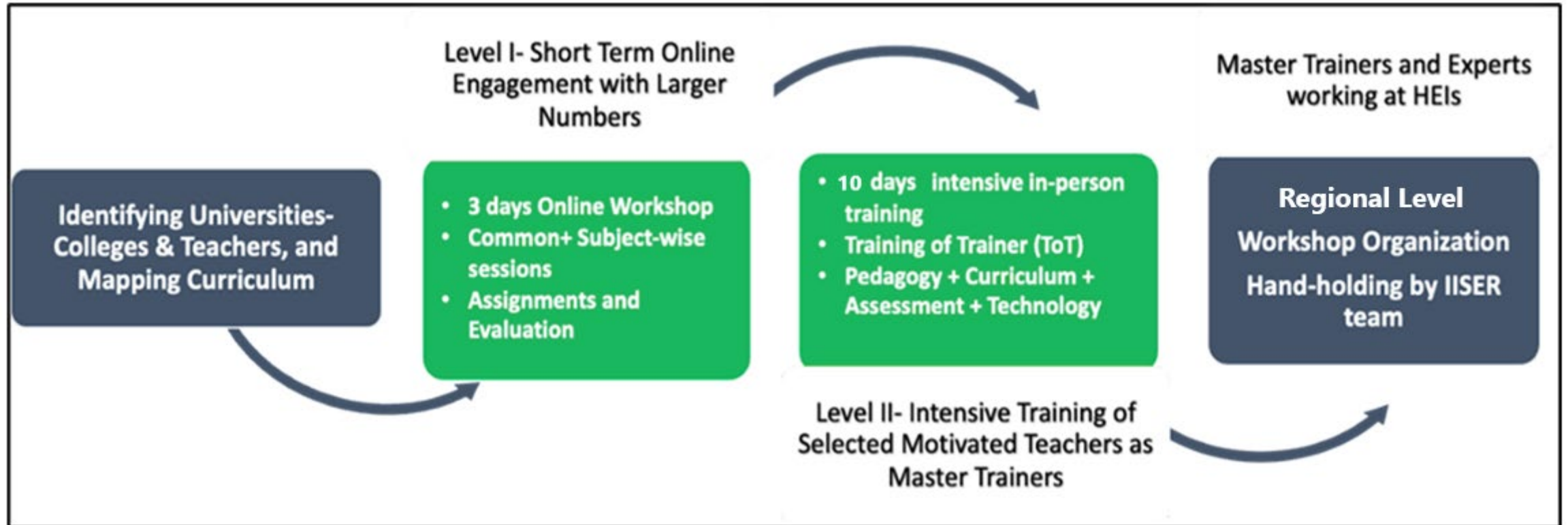
The need-based goals of MS-DEED Program

Formal Training for UG/PG Teachers on Teaching-Learning Process

Up-skilling and Capacity Building

NEED

Alignment to NEP 2020 Principles for Higher Education

Adapting to Effective Online-Education

Core Values of MS-DEED Program

Strengthen modern inquiry-based teaching skills

Promote research-based hands-on laboratory techniques

Inspire through subject/field experts in science and education

Inculcate core philosophies of science and mathematics education

Implementation of the MS-DEED programme

Level I- Short Term Online Engagement with Larger Numbers

Master Trainers and Experts working at HEIs

Identifying Universities-Colleges & Teachers, and Mapping Curriculum

- 3 days Online Workshop
- Common+ Subject-wise sessions
- Assignments and Evaluation

- 10 days intensive in-person training
- Training of Trainer (ToT)
- Pedagogy + Curriculum + Assessment + Technology

Regional Level Workshop Organization

Hand-holding by IISER team

Level II- Intensive Training of Selected Motivated Teachers as Master Trainers

Strategies to Overcome the Challenges of The Online Mode of Level 1 Workshops

Establishing a connect with the participants

Measures to address diversity and bring inclusivity

Increasing interactivity
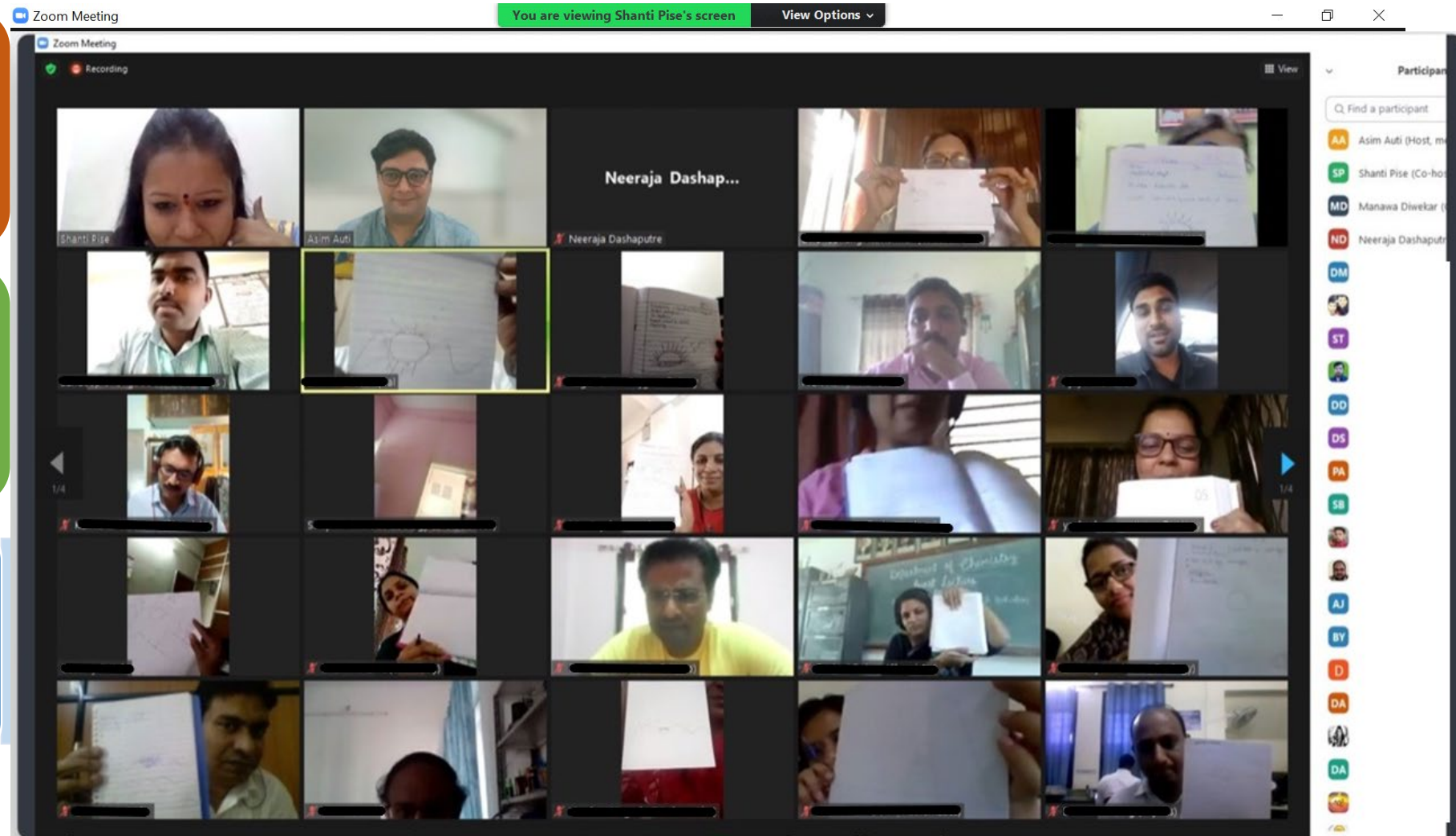
Designing the Workshop Contents to Promote Digital Pedagogical Skills
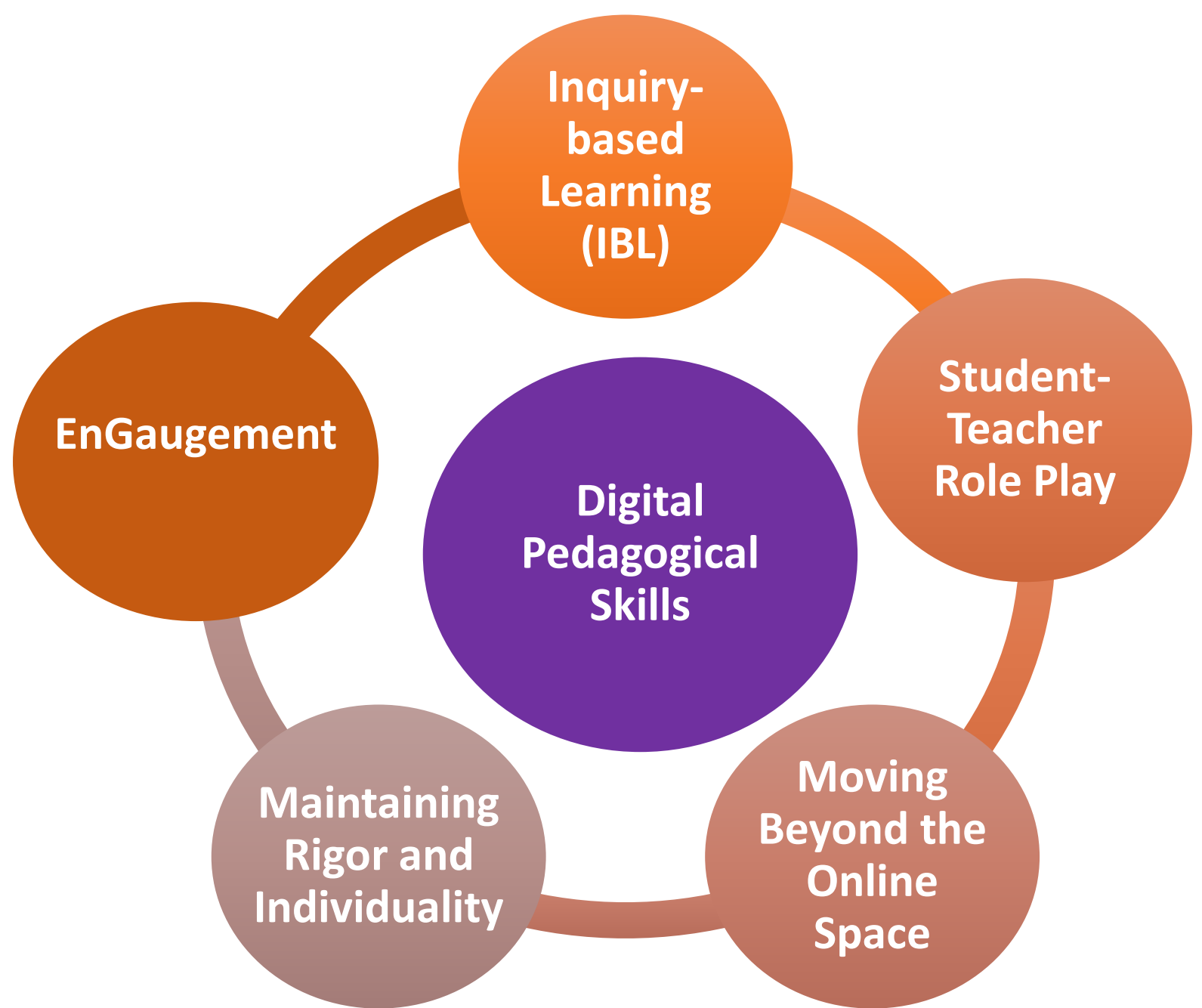
Inquiry-based Learning (IBL)

EnGaugement

Student-Teacher Role Play

Digital Pedagogical Skills

Maintaining Rigor and Individuality

Moving Beyond the Online Space

Designing the Workshop Contents to Promote Digital Pedagogical Skills

Inquiry-based Learning (IBL)

The focus of the various sessions was centered around Inquiry-based learning (IBL) in order to facilitate the incorporation of innovative pedagogies in the light of NEP 2020

- Relevance and significance of incorporating IBL through very simple yet enlightening examples

- Fruitful discussions among teachers of different subjects through inclusive discussion prompts

- Importance of addressing misconceptions through concept inventories

Designing the Workshop Contents to Promote Digital Pedagogical Skills

Student-Teacher Role Play

Demonstration of effective use of simulations in teaching science concepts, with the use of *PhET Interactive Simulations* and *CT-STEM* lessons

- Orient the teachers to find correct simulations and incorporating them effectively to promote inquiry & critical thinking skills

- Demonstrate how a teacher and a student would interact while using this digital pedagogical tool to enhance the learning by the inquiry-based approach
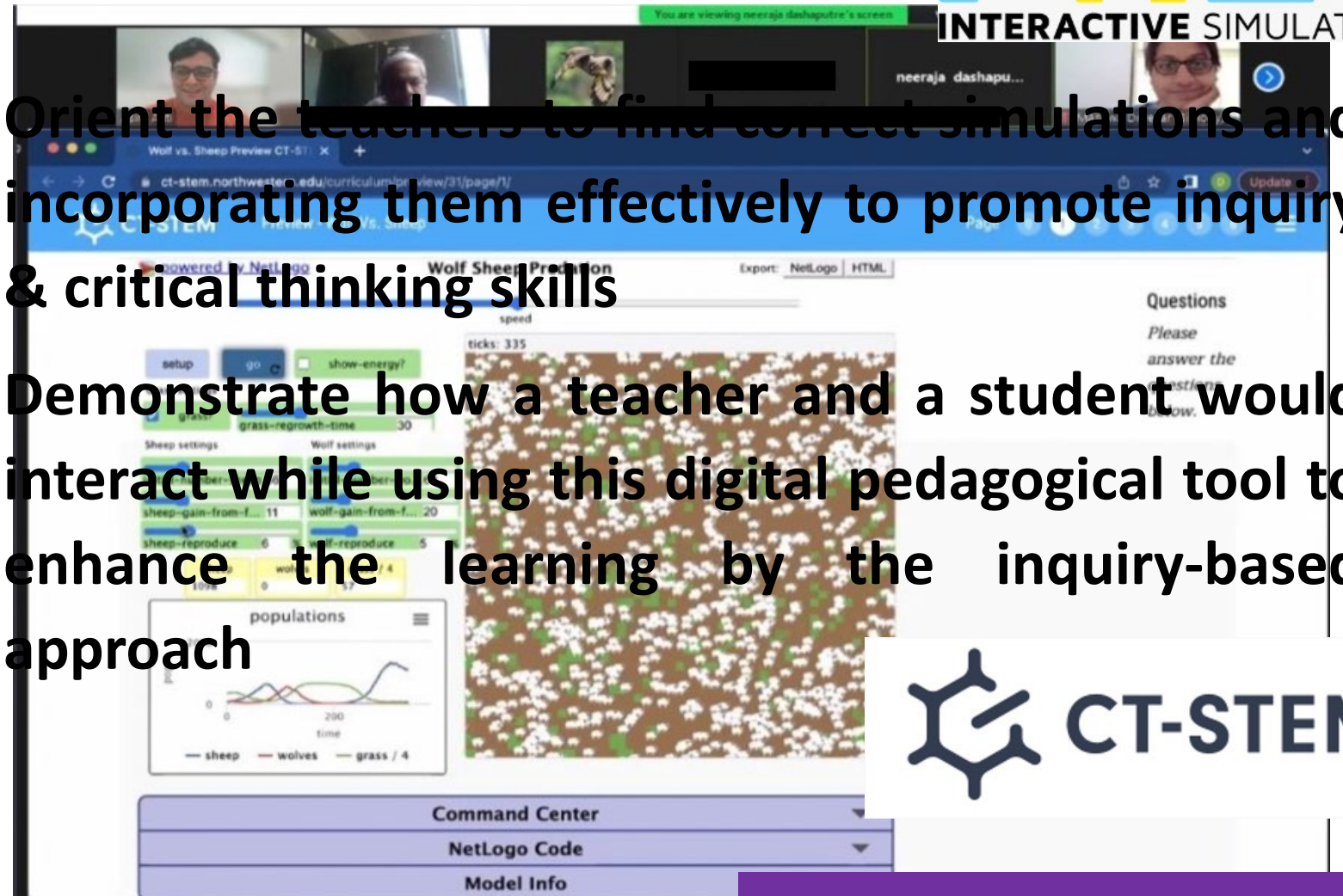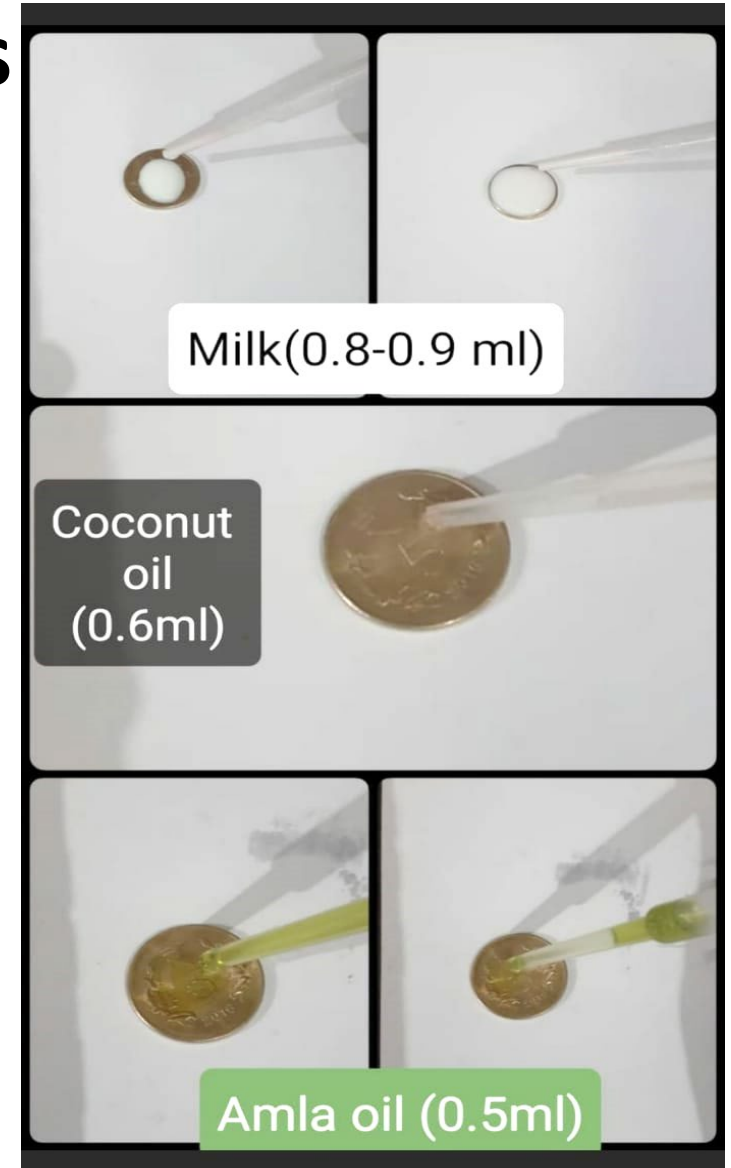
Designing the Workshop Contents to Promote Digital Pedagogical Skills

Moving Beyond the Online Space

How to use the existing technology and to develop newer modes of instruction that would enhance student engagement by not completely relying on only the online teaching

- Focusing on *Hands-on-Minds-on* philosophy, various non-digital activities were included in the program

- These activities were selected and designed with a **low-threshold-high-ceiling approach**

Milk(0.8-0.9 ml)

Coconut oil (0.6ml)

Amla oil (0.5ml)

Designing the Workshop Contents to Promote Digital Pedagogical Skills

Maintaining Rigor and Individuality

Subject-specific tools for effective teaching in Physics, Chemistry, Life Science, and Mathematics through a mix of innovative pedagogies

- **'Learnings from Subject-specific Exemplars'** session conducted by **Experienced subject experts** in four separate sections via the Breakout Room

- Elements of effective teaching such as types of inquiry methods, real-life context, designing learning outcomes, problem-solving, assessment etc.

Designing the Workshop Contents to Promote Digital Pedagogical Skills

'EnGaugement'

Process of joining active learning student engagement at the same time gauging students' progress using formative assessments

EnGaugements

- When you ask a student to <u>do</u> something, they are simultaneously *engaged* in learning and can *gauge* their progress by whether or how well they can perform.
  – Handelsman et al.
  Scientific Teaching.

  - Coin Experiment-Activity+Assessment (drawing)
  - ILO Quiz
  - Polls
  - Mentimeter
  - Padlet

ASSESSMENT to EnGaugement

Concept of EnGaugement was addressed through a dedicated session on *Assessment: Purpose and Strategies*

Encouraging Implementation and Building Community of Practice

- **Target Setting and Action Planning :**
  - ➢ *'Blockers and Enablers'*
  - ➢ *Setting SMART Targets*
  - ➢ *Action planning and Implementation at Colleges*
- **Ensure internal support by trainers and peers through social media platform**

What are your 5 main blockers?

ACTIONS and PRIORITIES - COLLEGE GROUPS

Please prioritise the action(s) you intend to take, when you will complete them, the resources (time, people, and materials) required, potential challenges/barriers and sources of support.

You may want to finish this back at your college and discuss with your senior leaders

ACTION PLAN

What will you do?		What are the success criteria (i.e. how will you know that you have succeeded)?	
Timings and key dates	Resources required (incl. time, materials)	Potential challenges/ barriers	Sources of support needed (e.g. other members of staff)

Action Point 2

What will you do?		What are the success criteria (i.e. how will you know that you have succeeded)?	
Timings and key dates	Resources required (incl. time, materials)	Potential challenges/ barriers	Sources of support needed (e.g. other members of staff)

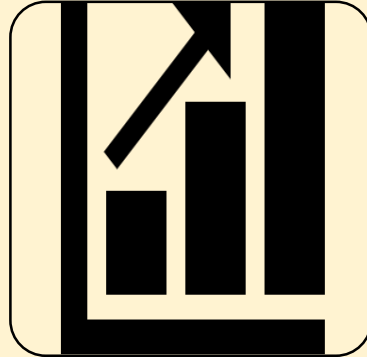# Encouraging Implementation and Building Community of Practice
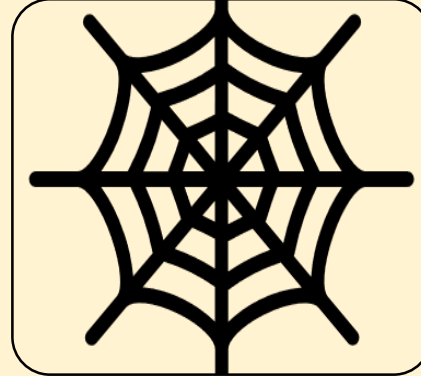

Breaking the online monotony through exercises
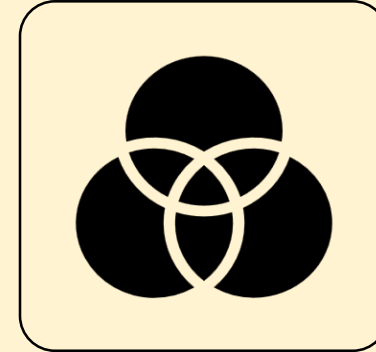
Our Experiences

Positive feedback through formal and informal mode

Effective module designing from learnings of each workshop

Community of practice with teachers from urban as well as rural set-up

Platform for addressing common issues of teachers

India is progressing step-by-step through such initiatives to accept the newer challenges of HE, following guidelines of NEP 2020 with diligent efforts of the teacher community and the required support from the system

References

1. Daugherty, K.: Backward Course Design: Making the End the Beginning. American Journal of Pharmaceutical Education 70 (6) Article 135 (2006). https://doi.org/10.5688/aj7006135

2. Handelsman, J., Ebert-May, D., Beichner R., Bruns, P., Chang, A., Dehaan, R., … Wood, W. Scientific Teaching. Science, 304 (5670), (2004). https://doi.org/10.1126/science.1096022

3. Pei, L. and Wu, H.: Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. Medical Education Online 24:1, 1666358 (2019). https://doi.org/10.1080/10872981.2019.1666538

4. NEP 2020, National Education Policy 2020, https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf, Govt. of India (2020).

5. Wong, D. A critical literature review on e-learning limitations. JASA 2 (2007).

6. PhET Homepage, https://phet.colorado.edu/

7. CT-STEM Homepage, https://ct-stem.northwestern.edu/

We would like to acknowledge the MSFDA for the financial support and IISER Pune for the infrastructure and other resources provided to conduct the series of Level 1 workshops under MS-DEED Program

**Thank you for the opportunity
and
Your kind attention**

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